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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,352	12/21/2001	Mauricio Calle	Calle 14-2/064	8092

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EXAMINER

SONG, JASMINE

ART UNIT PAPER NUMBER

2188

DATE MAILED: 04/19/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

SL

Office Action Summary

Application No.

10/026,352

Applicant(s)

CALLE ET AL.

Examiner

Jasmine Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-13 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6</u> . | 6) <input type="checkbox"/> Other: ____. |

Detailed Action

1. This office action is in response to request for reconsideration filed on 01/30/2004, paper #7. Claims 1-13 are still pending. All rejections and objections not explicitly repeated below are withdrawn.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

3. The rejections of Claims 1 and 3-13 as shown below are maintained.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,3,5-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cherukuri., U.S. Patent 6006307, in view of Rusu et al., U.S. Patent 6137807.

Regarding claims 1 and 6, Cherukuri teaches that a method of memory management, comprising:

providing multiple banks of memory devices organized into independent channels wherein each bank of memory devices contains duplicate data (col.2, lines 35-40);

providing a tree memory controller (memory control unit 22 as shown in Fig.1) for controlling data read and write accesses to each of the banks in each of the channels (col.4, lines 50 to col.5, lines 14);

sending read or write requests to the tree memory controller (col.5, lines 22-26);
establishing a bank queue for each bank in each channel (Fig.5, col.6, lines 63-67);

cherukuri does not teach that a bank queue for each bank designates bank availability; checking, at the tree memory controller, the availability of each bank; identifying a first available bank; and executing the read request from the first available bank.

However, Rusu et al., teach that a bank queue for each bank (Fig.1A, one of queue memory bank 1 and bank 2) designates bank availability (col.4, lines 32-35); checking, at the tree memory controller, the availability of each bank (col.4, lines 35 and lines 49-52); identifying a first available bank (it is taught as the most unused memory, col.4, lines 50-52); and executing the read request from the first available bank (col.4, lines 35 and lines 49-52).

As taught by Rusu, the use of the bank queue for designating bank availability, checking and identifying the availability of each bank and executing the read request from the available bank has the advantages of providing for balanced queue memory utilization to prevent queue congestion and overflow problems and to provide for queue control management providing for bidirectional simultaneous data flow permitting both input and output queuing to be performed concurrently (col.1, lines 20-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Rusu in the system of Cherukuri and have the bank queue for designating bank availability, checking and identifying the availability of each bank and executing the read request from the available bank for the advantages stated above.

Accordingly, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor. This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Regarding claim 3, Cherukuri teaches that the memory device comprise dynamic random access memory DRAM devices (col.4, lines 40-41).

Regarding claim 5, Cherukuri teaches that the banks of memory devices are organized into two independent channels (col.2, lines 36-38).

Regarding claim 7, Cherukuri teaches that the controller suspends all read requests during processing of a write request (col. 5, lines 22-26).

Regarding claim 8, Cherukuri teaches that the controller writes to all memory banks concurrently (col.4, lines 62-63).

Regarding claim 9, Cherukuri teaches that all memory banks contain identical data (col.2, lines 38-40 and col.4, lines 30-32).

Regarding claim 10, Cherukuri teaches that the memory banks comprise dynamic random access memory devices (col.4, lines 40-41).

Regarding claim 12, Cherukuri teaches that the banks of memory devices are arranged in two independent channels (col.2, lines 36-38).

6. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cherukuri., U.S. Patent 6,006,307 and Rusu et al., U.S. Patent 6,137,807, and further in view of Kawaguchi., US 2001/0030900 A1.

Regarding claims 4 and 11, Cherukuri and Rusu teach the claimed invention as noted above (the rejection of claims 1 and 6 is incorporated with herein), Cherukuri and Rusu do not teach that the memory device comprise fast cycle random access memory

FCRAM devices. However, Kawaguchi teaches that memory device comprises fast cycle random access memory FCRAM devices (col.1, section 0011)

As taught by Kawaguchi, the use of FCRAM having a late write function has the advantages of preventing operation errors of the FCRAM during auto-refresh, reducing the current consumption of the FCRAM during auto-refresh, improving the reliability of a memory cell of the FCRAM, and increasing the margin of refresh cycle time of the FCRAM (col.1, section 0011). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Kawaguchi in the system of Cherukuri and Rusu and have the FCRAM memory device for the advantages stated above.

Accordingly, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor. This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cherukuri, U.S. Patent 6,006,307 and Rusu et al., U.S. Patent 6,137,807, further in view of Bouchard et al., US 2003/0115403 A1.

Regarding claim 13, Cherukuri and Rusu teaches the claimed invention as noted above (the rejection of claim 6 is incorporated with herein), Cherukuri and Rusu do not teach that the minimum number of memory banks is determined by the ratio of the random cycle time to the random bank access delay. However, Bouchard teaches that

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the minimum number of memory banks is determined by the ratio of the random cycle time to the random bank access delay (col.1, section 0010)

As taught by Bouchard, the disclosure of the minimum number of memory banks is determined by the ratio of the random cycle time to the random bank access delay has the advantages of providing a maximum data throughput (co.2, section 0013). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Bouchard in the system of Cherukuri and Rusu and have the disclosure of the minimum number of memory banks is determined by the ratio of the random cycle time to the random bank access delay for the advantages stated above.

Accordingly, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor. This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Allowable Subject Matter

8. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to applicant's Arguments

9. Applicant's arguments filed 01/30/2004 regarding independent claims 1, 6, and claims 4,11,13 have been fully considered but they are not persuasive. However, claim 2 is withdrawn due to applicant's arguments regarding claim 2 are persuasive.

10. In response to applicant's argument that Rusu does not have a mirrored memory system and is not concerned with the same types or problems that applicant is dealing with in a mirrored memory system and it is not seen how it would be obvious to use the bank availability system in Rusu in the Cherukuri (see page 3, first few lines of applicant's remarks and last 8 lines of page 3, page 4, lines 1-5), However, it is noted that the primary reference Cherukuri teaches the mirrored memory system (Fig.1), in addition, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the combination of Cherukuri and the secondary reference Ruse would have motivated one of ordinary skill in the art to implement the above combination for the advantages of providing for balanced queue memory utilization to prevent queue congestion and overflow problems and to provide for queue control management providing for bidirectional simultaneous data flow permitting both input and output queuing to be performed concurrently (col.1,

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lines 20-27), therefore, the rejection based on the combination of cherukuri and Rusu is proper.

In response to applicant's argument that the references fail to show certain features of applicant's invention (cherukuri does not establish queues for both read and write operations, specifically, there is no indication that cherukuri considers using a queue during a read operation, see page 2 of applicant's "remarks"), it is noted that the features are not recited in the rejected claim(s). Applicant only claims establishing a bank queue for each bank in claim 1, this bank queue can be a write operation queue, it is not necessarily to be a read operation queue. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that the combination of Cherukuri and Rusu does not teach or suggest applicants' claimed invention (see page 6, lines 6 of applicant's remarks), however, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case,

the combination of Cherukuri, Rusu and Kawaguchi would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Kawaguchi in the system of Cherukuri and Rusu and have the FCRAM memory device for the advantages of preventing operation errors of the FCRAM during auto-refresh, reducing the current consumption of the FCRAM during auto-refresh, improving the reliability of a memory cell of the FCRAM, and increasing the margin of refresh cycle time of the FCRAM (col.1, section 0011).

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. When responding to the office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the

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art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111 (c).

13. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasmine Song whose telephone number is 703-305-7701. The examiner can normally be reached on 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 703-306-2903. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Jasmine Song
Patent Examiner

April 14, 2004

Mano Padmanabhan
Supervisory Patent Examiner

Technology Center 2100


JACK A. LANE
PRIMARY EXAMINER